

WaterLine

A publication about Ontario's water and wastewater industry.

Contents

- A message from OCWA
- Algae Blooms
- Water Smart Golf Courses
- Value Assessments
- A Fond Farewell

Stemming the tide

More municipalities taking action against costly water system leaks

Each day, Canadian municipalities lose billions of litres of clean, treated drinking water through leaks in underground pipes.

With pipes buried out of sight, the problem, to a large extent, is an invisible one. Nonetheless, municipalities are losing vast volumes of water to system leaks. At the same time, they're spending valuable dollars on hydro, chemicals and staffing costs to treat and distribute this 'lost' water. With less water making its way to end users, many communities are faced with the prospect of massive capital costs to upgrade their facilities.

Recognizing the problem may worsen as pipes age, more communities are implementing programs to locate and repair these leaks.

In 2007, the Town of Carleton Place noticed daily water demand had increased by 25 per cent. A leak detection program found a leak which was quickly repaired, allowing the town to delay facility upgrades.

That same year, the City of Toronto conducted a comprehensive water loss assessment. The study revealed the city was losing about 103 million litres a day. Since then, they've instituted an ambitious

program to address the situation.

This past spring, after noticing that monthly water use had jumped by more than 50 per cent, the Municipality of Bluewater authorized OCWA to initiate a leak detection program. The Agency verified the existence of a significant leak under a busy street. Contractors were brought in to repair the leak.

OCWA Operations Manager Marcel Misuraca says it's lucky the street above the leak didn't cave in. "When the contractors began digging, they realized the leaking water had washed away much of the road base, leaving a large cavity beneath the pavement," he says. "Because of this leak, there was literally nothing holding up the road in that area."

So how is a municipality supposed to know if it has a problem with system leaks? "One of the first things to watch for is a prolonged spike in usage levels," says Misuraca. "If pumping hours are rising, that's another possible sign. And in some cases, you might actually see water pooling above ground."

Finding and fixing water leaks can be a slow, ongoing battle, but it's one worth

fighting. Leak detection can save a significant amount of money and help municipalities delay costly facility expansions. "If you suspect you have a leak, bring in professionals to conduct a leak detection program and investigate," says Misuraca. "As more municipalities are discovering, it's a worthwhile investment."

The science of leak detection

Here are some techniques used to identify underground leaks:

Improved metering – By comparing water flows out of the plant and into homes and businesses, municipalities can gauge how much water is being lost.

Correlation technology – Underground sound data is processed using a mathematical algorithm, which helps locate leaks.

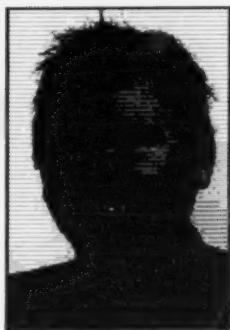
Acoustic leak detection – High performance listening equipment is used to pinpoint the location of a leak.

Night flow measurements – If nightly flow readings don't decrease as much as they should, a leak could be the culprit.



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Taking inspiration from Singapore's water story

A message from Nick Reid,
OCWA's VP Business Development

Just 40 short years ago, Singapore's drinking water situation was dire. The country had no ground water to speak of. The little surface water it had was terribly polluted. With no other alternatives available, Singapore was forced to import virtually all its drinking water from neighbouring Malaysia.

Today, Singapore is celebrated as a global success story – a major hub that was able to take significant steps toward water sovereignty thanks to a radical change in the way it thinks about this precious

resource. I witnessed the results of this remarkable transformation firsthand this past summer as an attendee at the Singapore International Water Week 2011 Conference. That Singapore plays host to this massive annual conference (1,100+ participants from 64 countries/regions) speaks volumes about how far the country has come in a relatively short time.

Singapore was able to achieve this transformation through infrastructure improvements, environmental cleanup efforts, ambitious public awareness

campaigns and extensive research and development. In fact, over the past five years, Singapore has spent an incredible \$500 million on research and development related to drinking water. The results of this national commitment speak for themselves: a stable, sustainable water supply and an entire culture that truly embraces the value of water.

Wherever you go in Singapore, you'll find water features, splash pads, pools and fountains. Touring the country, you never get the feeling water is in short supply. Having said that, the average per capita use of water in Singapore is less than half of what it is in Canada.

While Canadians often feel the need to make a choice between 'enjoying' and 'conserving' water, it seems the people of Singapore have found a way to do both at the same time. Given the success of the country's remarkable drinking water transformation, perhaps there's a lesson in there for the rest of us.

The return of the algae blooms

While they were kept in check for much of the past four decades, unsightly and potentially harmful blue-green algae blooms have returned to the Great Lakes in a big way.

In the 1970s, cyanobacteria (also known as blue-green algae), was a major problem in the Great Lakes. At the time, inter-governmental cooperation, combined with action on the part of local municipalities and residents to reduce nutrient inputs to various waterways, helped get the unattractive and potentially harmful blooms under control. Two decades later, however, the problem had resurfaced. Algae blooms have reappeared, indicating that programs currently in place may no longer be adequate to control the problem. Scientists from Environment Canada, working in partnership with the Ontario Ministry of the Environment, are reporting that phosphorous levels –

generally accepted to be the primary cause of blue-green algae blooms – are as high today as they were at the height of the problem back in the 1970s. As a result, all three levels of government are once again working together to develop a response to this growing threat.

Experts suggest increased nutrient levels are the result of a number of changes that have taken place in the Great Lakes basin ecosystem over the past several years, including the proliferation of zebra mussels, changes in precipitation and temperatures and agricultural and urban population growth. Each of these factors increases nutrient loading to the province's waterways and, in turn, helps to encourage the growth of the primitive, microscopic water plants.

Scientific researchers are currently work-

ing to better understand both causes and effects of the blue-green algae blooms. "The issue needs to be understood in the context of contributing watersheds," says Bonnie Fox, Policy and Planning Specialist with Conservation Ontario, the agency that represents Ontario's 36 Conservation Authorities. "How much of the nutrients are coming from which watersheds and which management actions within those watersheds are the most effective at reducing the problem?" Environment Canada is also piloting a new approach to nutrient management in Lake Erie. And across Canada, work is being done to help improve wastewater infrastructure, in particular treatment and collection systems, to help facility operators to do an even better job of managing stormwater and preventing avoidable bypasses.

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Technological innovation will also play a key role in addressing the issue by providing researchers with new ways to detect, measure and monitor the effects of nutrient levels on Great Lakes aquatic ecosystems. The hope is that this work will help scientists to better understand the causes and effects of blue-green algae blooms and, ultimately, to prevent future infestations.

How Ontarians can help reduce/prevent blue-green algae blooms

Blue-green algae blooms can occur when nutrients are readily-available in the surface water body. There are things Ontarians can do to help reduce the amounts of these nutrients in our waterways, including:

- Using phosphate-free detergents,
- Refraining from using fertilizers,
- Maintaining a naturalized shoreline on lakefront properties,
- Taking steps to reduce agricultural run-off,
- Populating setbacks along waterways with plants, and
- Ensuring that septic systems don't leak.

(Source: Ontario Ministry of the Environment)

For additional reading:

www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/cyanobacter-eng.php

Now Available

OCWA's Water and Wastewater Courses Now Available to Industry Professionals

As of Fall 2011, OCWA's water and wastewater courses will be open to all operators across Ontario. For more information on OCWA's Operational Training Program, including course descriptions, calendar and cost, please visit http://www.ocwa.com/en/training_services

How 'water smart' is your local golf course?

How green is the course where you golf?

The reality is that of the more than 2,400 golf courses in Canada, most were designed with little or no consideration given to environmental issues. Years of excessive watering, pesticide and herbicide use have led to environmental damage and criticism from environmental groups. But an increasing number of Canadian golf courses are embracing environmentally-responsible and sustainable approaches to course design, construction and maintenance.

The biggest environmental concern for golf courses is water. Consider that a typical 18-hole golf course uses 1.2 to 3.8 million litres to water its grass just once. Over the course of a season, a golf course can use up to 189 million litres of water, which can reduce or deplete groundwater supplies in the area.

Here are some of the ways leading golf courses are working to reduce water consumption:

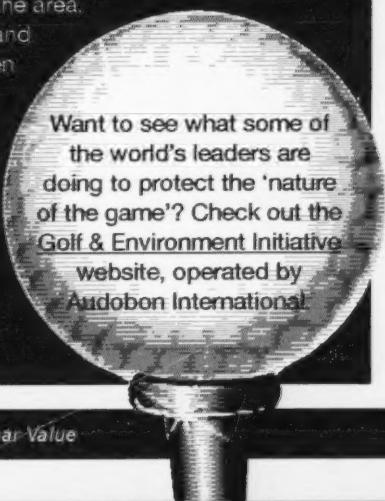
- **Irrigation with recycled water** – More golf courses are using effluent from wastewater plants for irrigation.
- **Water-friendly landscaping** – Many courses are opting for plants that need minimal amounts of water, pest controls and fertilizers.
- **Improved turf science** – Scientists are developing new types of grass that require less water but perform as required on fairways and greens.
- **Reductions in course size** – Some courses are reducing the amount of acreage maintained as turf and/or substituting low-maintenance vegetation in the rough. Others are reducing the widths of fairways, which lowers demand for water and pesticides.

"We're seeing an increasing number of golf courses that are conscientiously working to reduce inputs of all types, including water," says Ken Cousineau, Executive Director of the Canadian Golf Superintendents Association (CGSA). "In fact, the CGSA's recent Environmental Best Management Practices Survey found that approximately 28% of golf courses across Canada are currently using groundwater to satisfy some of their irrigation needs."

One such example is the Kingsville Golf and Country Club, which has been irrigating its course with recycled effluent from the Lakeshore West Wastewater Treatment Plant since 2005 – a solution originally proposed by OCWA operations staff following extended drought conditions in the area.

The initiative has been a tremendous success and has resulted in a dependable water source (even in the driest of seasons), enhanced turf quality and reduced demand on the town's water supply.

So the next time you're out for a round, ask what your local golf course is doing to help reduce water use and protect the environment.



Want to see what some of the world's leaders are doing to protect the 'nature of the game'? Check out the **Golf & Environment Initiative** website, operated by Audubon International.

Value Assessments can translate into savings for municipalities

Value Engineering, a systematic approach to improving the efficiency of construction projects, has been used in the United States since World War II. Typically, the process involves bringing together a room full of experts for several weeks to pull apart an engineering project, study it and put it back together in such a way as to ensure every element of the design delivers maximum value. Considering that Value Engineering has the potential to significantly reduce costs on capital projects, it's surprising more Ontario municipalities aren't taking advantage of the process.

One possible reason for the reluctance could be cost. "A typical Value Engineering process entails assembling numerous engineers, various industry experts and stakeholders in a room for up to a week or more. There's a significant amount of time and brain power that goes into these types of exercises and, understandably, the costs can get quite high," says Andy

Valickis, Director, Engineering Services at OCWA.

However, in an effort to help Ontario municipalities reduce costs, OCWA has developed a slimmer, more cost-effective version of Value Engineering called Value Assessment. This new variation sets out to accomplish similar goals to the traditional Value Engineering process, but in a much shorter timeframe.

The Value Assessment process is comprised of two one-day workshops:

- The first workshop focuses on the design concepts. The facilitators bring together a team of independent process design experts, along with the designers who developed the plans and the operational team that will run the facility. Together, they deconstruct the project from a 'process' perspective and identify opportunities for efficiencies and cost savings.

- The second stage, which takes place about a third of the way into the design of the project, includes the same players as in stage one, but also invites a team of construction engineers and contractors. The focus at this stage is to study the constructability of the project and to identify efficiencies that can be realized in the construction process.

In one Ontario community in 2011, a Value Assessment process helped identify savings of approximately \$2 million on a \$20 million construction project (10 per cent of the total budget). The cost of the Value Assessment process was less than \$25,000, providing the municipality with a very healthy return on investment.

In these challenging economic times and with cost savings to be had, Value Assessment sessions are something more Ontario municipalities may want to investigate when undertaking major capital projects. To learn more about how Value Assessments can help your municipality save money on its next water or wastewater capital project, contact Andy Valickis at 416-314-5551 or avalickis@ocwa.com.

OCWA bids a fond farewell to Dave McCully

Announces retirement after 33 years of service

After a long and distinguished career in which he served as Water Systems Manager for one of Canada's largest water systems, David McCully has officially retired.

McCully retired this past summer after 33 years at the Lakeview Water Treatment Plant in Mississauga. Over the course of more than three decades, McCully made a strong and lasting impression on clients, co-workers and industry colleagues alike – not only for his impressive technical knowledge, but also for his tireless community support efforts and great sense of humour.

"Throughout his career, David was always the consummate professional," says David Edwards, OCWA's Regional Manager for South Peel and Acting V.P. Operations,

South. "He would always be the first to jump to solve a problem and then downplay his role in the successful outcome."

"The funny thing is that when I first started at South Peel in the 1970s, I only intended to stay for about six months," says McCully. Thankfully for the Region and for OCWA, McCully "kept finding interesting things that needed to get done and great people to work with."

In addition to his exemplary efforts on the job, the community-minded McCully was always quick to volunteer for a worthy cause, to help raise funds for charities and play a role in supporting one of his passions – minor hockey.

While he is embarking upon a well-deserved retirement, McCully's legacy lives on at the facility through his former



colleagues. "David's constant mentoring approach was a tremendous asset to those who worked with him and his legacy lives on in the skill and expertise they demonstrate on the job every day," says Edwards. "He was always dedicated to his staff and had brought a positive view to every situation. Once again, we want to recognize his exceptional service and wish him well in his retirement."



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